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Morphology and Rheology of Poly(styrene-*co*-methacrylic acid) Ionomers: Effect of Acid Content, Degree of Neutralization and Cation Type WENQIN WANG, TSUNG-TA CHAN, KAREN I. WINEY, Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, Pennsylvania 19104-6272 — Our group has recently applied both scanning transmission electron microscopy (STEM) and x-ray scattering to investigate the size and number density of spherical, ionic aggregates in a poly(styrene-*co*-methacrylic acid) (SMAA) copolymer neutralized with copper. By accounting for the extensive overlap in the STEM image, the imaging and scattering data are in excellent agreement. In this presentation, we will extend our investigation to a wider range of SMAA ionomers to probe the influence of the acid content, the cation type and the level of neutralization. Early results indicate that (1) ionic aggregates form when the acid content is $> 5\text{mol}\%$ and (2) the size of ionic aggregates in Cu-neutralized SMAA is independent of the percent neutralization. To compliment our morphological studies, rheological properties of these materials are probed in the linear viscoelastic regime.

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